U.S. FISH AND WILDLIFE SERVICE
SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Synthliboramphus hypoleucus*

COMMON NAME: Xantus's murrelet

LEAD REGION: Pacific Southwest (Region 8)

INFORMATION CURRENT AS OF: April 2010

STATUS/ACTION

___ Species assessment - determined we do not have sufficient information on file to support a proposal to list the species and, therefore, it was not elevated to Candidate status
___ New candidate
_X_ Continuing candidate
___ Non-petitioned
_X_ Petitioned - Date petition received: 8 April 2002
_ 90-day positive - FR date:
_ 12-month warranted but precluded - FR date:
_ Did the petition request a reclassification of a listed species?

FOR PETITIONED CANDIDATE SPECIES:
a. Is listing warranted (if yes, see summary of threats below)? Yes
b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? Yes
c. If the answer to a. and b. is "yes", provide an explanation of why the action is precluded. Higher priority listing actions, including court-approved settlements, court-ordered and statutory deadlines for petition findings and listing determinations, emergency listing determinations, and responses to litigation, continue to preclude the proposed and final listing rules for the species. We continue to monitor populations and will change its status or implement an emergency listing if necessary. The "Progress on Revising the Lists" section of the current CNOR (*http://endangered.fws.gov/*) provides information on listing actions taken during the last 12 months.

___ Listing priority change
Former LP: ___
New LP: ___
Date when the species first became a Candidate (as currently defined): 4 May 2004
___ Candidate removal: Former LPN: ___
___ A – Taxon is more abundant or widespread than previously believed or not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.
___U – Taxon not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status due, in part or totally, to

conservation efforts that remove or reduce the threats to the species.
___ F – Range is no longer a U.S. territory.

___ I – Insufficient information exists on biological vulnerability and threats to support listing.
___ M – Taxon mistakenly included in past notice of review.
___ N – Taxon does not meet the Act's definition of "species."
___ X – Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Birds, Alcidae

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: California, Oregon, Washington, Mexico, Canada

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: California, Oregon, Washington, Mexico, Canada

LAND OWNERSHIP:
Table 1: Land ownership of islands with known or historical Xantus's murrelet nesting colonies

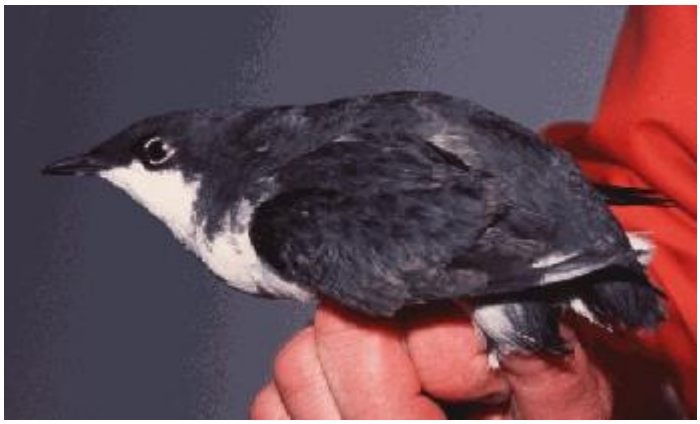
Island	**Ownership**
Santa Barbara	National Park Service
Anacapa	National Park Service
Santa Cruz	National Park Service, Nature Conservancy
San Miguel	Department of the Navy, but managed by National Park Service
San Clemente	Department of the Navy
Santa Catalina	Santa Catalina Conservancy and other private owners
Guadalupe	Mexican Government (Isla Guadalupe Biosphere Reserve)
Coronado	Mexican Government
Todos Santos	Mexican Government
San Martin	Mexican Government
San Jeronimo	Mexican Government
Cedros	Mexican Government
San Benitos	Mexican Government

LEAD REGION CONTACT: Pacific Southwest Region (R8): Andy DeVolder, (916) 414-6464, Andy_DeVolder@fws.gov

LEAD FIELD OFFICE CONTACT: Ventura Fish and Wildlife Office: Robert McMorran, (805) 644-1766 extension 232, Robert_McMorran@fws.gov
BIOLOGICAL INFORMATION

Species Description

Xantus's murrelet (*Sythliboramphus hypoleucus*) is a small seabird, 23-25 centimeters (9-10 inches) in length and weighing approximately 148-187grams (5-7 ounces) (Drost and Lewis 1995, p. 2; Jehl and Bond 1975, p. 14; Murray *et al*. 1983, p. 14). Plumage is black above and white below, and except upon careful inspection, winter plumage is not different from breeding plumage (Drost and Lewis 1995, pp. 2, 19). They fly straight and close to the water with rapid, whirring wing-beats (Gaston and Jones 1998, p. 205, Griggs 1997, p. 12). They are known to live up to 16 years of age in the wild (Carter *et al*. 1992, p. I-222).



Source: NOAA

Taxonomy

The taxonomic status of *Synthliboramphus hypoleucus* as a distinct species appears to be widely accepted (e.g., Jehl and Bond 1975, p. 9; DeWeese and Anderson 1976, pp. 155-168; Drost and Lewis 1995, p. 5; Gaston and Jones 1998, p. 205). *S. hypoleucus* is similar in appearance to the closely-related *S. craveri* (Craveri's murrelet); however, they apparently do not interbreed where their breeding ranges overlap in Mexico, because *S. craveri* nests earlier in the season (December through March) (Jehl and Bond 1975, p. 20).

Synthliboramphus hypoleucus is divided into two subspecies: *S. h. scrippsi* and *S. h. hypoleucus* (Jehl and Bond 1975, pp. 9-24; Drost and Lewis 1995, p. 4). Substantial declines have been documented in both subspecies, and the species as a whole has been assigned candidate status. The subspecies differ in breeding range, facial plumage, bill size, and vocalizations (Jehl and Bond 1975, pp. 11-19). *S. h. scrippsi* nests from the Channel Islands off the southern California coast south to San Benito Islands in Mexico; *S. h. hypoleucus* nests farther south, on Guadalupe and San Benito Islands off Baja California, Mexico (Jehl and Bond 1975; p. 11, Keitt 2005, pp. 109-112). Both subspecies occur along with small numbers of an intermediate form (indicative

of limited interbreeding) on San Benito Island (Jehl and Bond 1975, p. 11; Winnett *et al*. 1979, p. 81; Keitt 2005, pp. 110-111; Whitworth *et al*. 2003, p. 9).
Synthliboramphus hypoleucus scrippsi has a bill that is slightly shorter and thicker than *S. h. hypoleucus* (Jehl and Bond 1975, p. 13). In *S. h. scrippsi*, the area in front of and behind the eye is black with a dividing line between the black crown and face and white throat extending straight back from the bill. *S. h. hypoleucus* has white extending up in front of the eye; white above the gape; broader white below the eye; and paler, grayish feathers that cover the ear openings (Jehl and Bond 1975, pp. 13,15).

Habitat/Life History

Xantus's murrelets spend the majority of their lives at sea, only coming to land to nest. They begin arriving within the vicinity of nesting colonies in December and January (Murray *et al*. 1983, p. 14; Gaston and Jones 1998, p. 209). They likely begin breeding at 3 to 4 years of age, and usually nest at the same site each year with the same mate (Murray *et al*. 1983, p. 15; Sydeman *et al*. 1998, p. 12). They begin visiting nest sites up to 2 months before egg-laying, but typically 2 to 3 weeks prior (Murray *et al*. 1983, p. 14). Nesting within the population is asynchronous, spanning a period of up to 4 months (March-June), and peak time of egg-laying varies from year to year (Hunt *et al*. 1979, p. III-174, Murray *et al*. 1983, p. 17).

Xantus's murrelets congregate on the water adjacent to nesting colonies at night throughout the breeding season (Hunt *et al*. 1979, p. 1III-187; Murray *et al*. 1983, p. 14). The purpose of these nocturnal at-sea congregations may be for socialization, courtship, pairing, and pair-bond maintenance, and the birds engage in vocalizations (Carter *et al*. 1995, p. 7; Gaston and Jones 1998, p. 209). The majority of murrelets in these congregations are likely non-incubating, because incubating murrelets may only briefly attend congregations before flying to nests after return from foraging trips, or during chick departures from the nest (Hunt *et al*. 1979, p. III-205; Gaston and Jones 1998, p. 208; Whitworth *et al*. 1997, pp. 526, 530).

Xantus's murrelets nest in small caves, rock crevices, cavities under boulders or roots, and under dense vegetation on offshore islands or associated rocks, often along steep slopes or cliffs (Hunt *et al*. 1979, p.1III-171; Murray *et al*. 1983, pp. 13, 16). No additional material is added to the nest, and the site may either be a shallow scrape if the ground is soft, or remain unmodified (Murray *et al*. 1983, p. 16). They are nocturnal in their arrival to or departure from nests, presumably to avoid detection by avian predators such as gulls, owls, and falcons (Murray *et al*. 1983, p. 19; Gaston and Jones 1998, p. 210).

Xantus's murrelets typically lay two eggs and both parents share incubation duties (Murray *et al*. 1983, p. 19). The first egg is left unattended until after the second egg is laid, for an average of 8 days (range: 5 to 12 days), and incubation lasts about 34 days after clutch completion (range: 27-44 days) (Murray *et al*. 1983, pp. 14, 16). Eggs are also periodically left unattended during incubation, presumably because one member of the pair will depart to feed before the other returns; egg neglect increases the total length of incubation (Murray *et al*. 1983, p. 18). Unattended eggs are susceptible to predation by native deer mice or introduced rats (Murray *et al*. 1983, p. 20). Each parent spends an average of 3 consecutive days incubating eggs before

being

relieved by the mate (range: 1 to 6 days) (Murray *et al*. 1983, p. 18). These incubation shifts are among the longest recorded for alcids (Drost and Lewis 1995, p. 13).

Chicks hatch between early April and early July, and are born precocial (covered with down and fully active) (Murray *et al*. 1983, pp. 12, 18). The chicks are not fed in the nest after hatching, but go to sea with their parents at about 2 days of age (range: 1 to 5 days) (Murray *et al*. 1983, pp. 18, 19). The chicks are escorted out of the nest by their parents, and then they either jump from the cliff edge or are blown into the surf below, while the parents vocalize from the sea below (Murray *et al*. 1983, p. 19). Family groups swim rapidly offshore and away from nesting colonies, presumably to avoid predators (Murray *et al*. 1983, p. 19). The chicks are reared at sea by their parents, and remain with their parents at sea for an unknown amount of time (Murray *et al*. 1983, p. 19).

Xantus's murrelets swim underwater to capture prey, using their wings to propel themselves forward in a technique known as pursuit-diving (Drost and Lewis 1995, pp. 6-8). They feed offshore in small, dispersed groups, usually in singles and pairs, but occasionally in groups of up to eight (Howell 1917, p. 185; Hunt *et al*. 1979, pp. III-184). They feed on small schooling fish and zooplankton, and may forage at ocean fronts where prey is concentrated near the surface of the water (Hunt *et al*. 1979, p. III-184; Hamilton *et al*. 2004, p. 155; Hamilton 2005 pp. 8, 61, 65, 66). During the breeding season, the distance that they travel from nesting colonies to obtain prey is highly variable and probably dependent upon the availability and location of prey patches (Whitworth *et al*. 2000, p. 277; Hamilton 2005, p. 66). For example, murrelets from Santa Barbara Island foraged far from the island in 1996 (mean = 62 km (40 miles)) and 1997 (mean = 111 km (69 miles)) (Whitworth *et al*. 2000, p. 274), whereas murrelets from Anacapa Island in 2002 and 2003 usually foraged within 20 km of the island (Hamilton 2005, p. 34). Long incubation shifts, the ability to leave eggs unattended, and the fact that chicks go to sea at two days of age may allow for long-distance foraging from nesting colonies to obtain prey (Carter *et al*. 1992, pp. I-220, I-122).

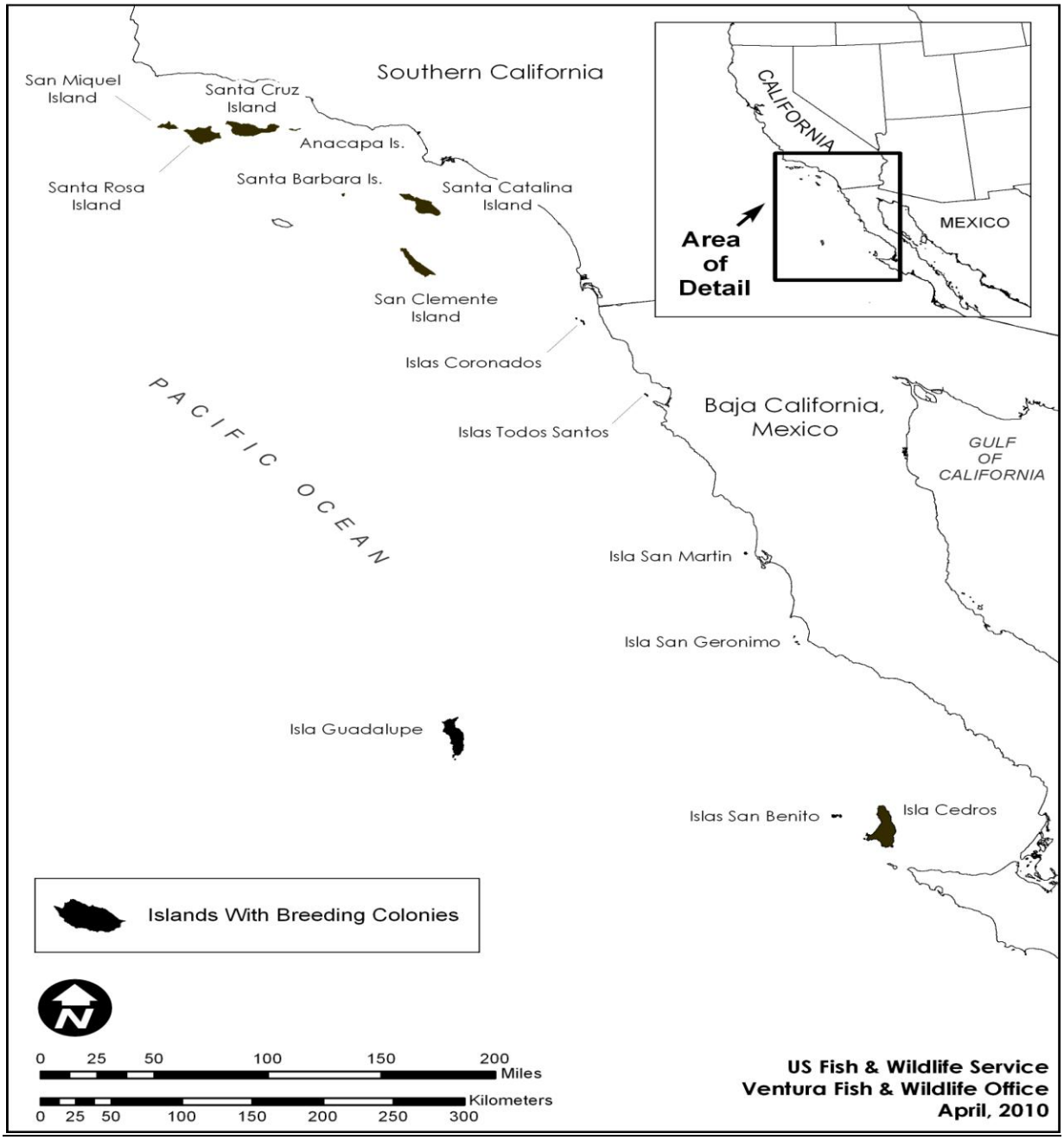
Historical Range/Distribution

The historical breeding range of Xantus's murrelets was from the Channel Islands in southern California to islands off the west coast of Baja California, Mexico (Jehl and Bond 1975, p. 11; Hunt *et al*. 1979, p. III-165; Carter *et al*. 2000, pp. 435-436). Known nesting islands in southern California included San Miguel, Santa Cruz, Anacapa, Santa Barbara, San Clemente, and Santa Catalina Islands, collectively known as the Channel Islands. Known or suspected nesting islands off the west coast of Baja California, Mexico include Coronado, Todos Santos, San Jeronimo, San Martin, San Benitos, Cedros, and Guadalupe Islands off the coast of Baja California, Mexico (Keitt 2005, pp. 105, 110-111; H.R. Carter, unpubl. data). Earlier reported breeding at Asuncion and San Roque Islands in central western Baja California may have been misidentified *S. craveri* (Keitt 2005, p. 110; H.R. Carter, unpubl. data).

Current Range/Distribution

The current breeding range of Xantus's murrelets is most likely the same as the historic range. Post-breeding and winter distribution occurs off the breeding range plus: a) north of southern California to central and northern California, Oregon, Washington, and southern British Columbia; and b) south of central western Baja to Cabo San Lucas at the south tip of the Baja peninsula (Karnovsky *et al*. 2005, p. 97).

Xantus' Murrelet Breeding Locations



Population Estimates/Status

Xantus's murrelets appeared to be fairly abundant and were referred to as "common" in early accounts (Grinnell and Miller 1944, p. 179; Howell 1917, p. 22), although there are no reliable estimates of the historical population. Since the late 19th century, breeding populations on several islands in southern California and northwestern Baja California appear to have declined considerably due mainly to impacts from introduced cats and rats (Drost and Lewis 1995, pp. 10, 16-18; McChesney and Tershy 1998, pp. 336, 341-342, 344; PSG 2002, pp. 6, 8). The most recent estimate of the population (based on at-sea surveys in 1975-2003) is 39,700 birds, consisting of 17,900 breeding birds and 21,800 subadults/nonbreeders (Karnovsky *et al*. 2005, p. 101). This estimate is larger than most recent colony-based estimates (Burkett *et al.* 2003, p. 13). More information on colony-based estimates in Baja California has been gathered but is not yet available (H.R. Carter, pers. comm. 2010).

Santa Barbara Island currently is the largest breeding colony in California, with 500 to 750 pairs (Whitworth *et al*. 2005a, p. 17). Xantus's murrelets likely declined due to introduced non-native cats in the late 19th and early 20th centuries, changes in island vegetation (due to ranching and farming) and changes in native populations of deer mouse (*Peromyscus maniculatus elusus*) and barn owls (*Tyto alba*) (due to altered habitats). Cat numbers on Santa Barbara Island have been relatively low since the 1920s and the last cat was eradicated in 1978 (Murray *et al*. 1983, p. 13). Hunt *et al*. (1979, pp. III-161, III-168) thought that the population had increased from the early 1900s to 1977. However, there is more recent evidence of a 30 to 72 percent population decline from 1977 to 1991; the degree of decline is uncertain due to different survey techniques (Hunt *et al*. 1979, p. III-186; Carter *et al*. 1992, p. I-223; Sydeman *et al*. 1998, pp. 2, 9-11, 23). Consistent with continued decline after 1991, numbers of active nests were 14% lower at northeastern Santa Barbara Island in 2001 than in 1991 (Whitworth *et al*. 2003, pp. 4, 8, 13). Nest site occupancy in plots monitored since 1983 also decreased during the 1990's and 2000's, although numbers of eggs hatching increased (Schwemm *et al*. 2005, p. 388). Chief apparent reasons for decline since the 1970s include high predation levels by native predators in human-altered island habitats and changes in prey availability due to ocean climate change.

Average productivity at Santa Barbara Island from 1983 to 1995 was low, at 0.81 chick per pair (Sydeman *et al*. 1998, pp. 23, 31). Ancient murrelets (*Synthliborampus antiquus*) average 1.44 to 1.69 chicks per pair; this lower productivity may be a result of high predation rates rather than a natural life history trait (Sydeman *et al*. 1998, pp. 23-24). If an annual 2.5 to 5.3 percent decline continues, this colony may reach a level at which the likelihood of survival is decreased and would eventually lead to the colony's extirpation (Sydeman *et al*. 1998, p. 2).

Anacapa Island currently is the second-largest breeding colony in California (200 to 600 pairs) (Burkett et al. 2003, Table 2; H.R. Carter, unpubl. data). This colony likely suffered population decline since the late 19th century mainly due to the presence of non-native rats (McChesney *et al*. 2000, pp. 3, 12, Whitworth *et al*. 2005b, pp. 131, 134). However, eradication of rats in 2001 to 2002 has led to recently improved hatching success and limited colony growth (Whitworth *et al*., 2009, pp. 13-19). Prey availability does not appear to be a problem at Anacapa in most years

at present.

San Miguel Island is the northernmost colony in the breeding range, has a relatively small breeding population (10-50 pairs), appears to be declining, and is nearing extirpation (Carter *et al*. 2008, p. 5). The chief apparent reason for small population size is limited breeding habitats with low predation by native and non-native predators. Chief apparent reasons for decline include recent predation by non-native rats on the main island, impacts to nesting habitats on Prince Island due to guano mining and past Navy bombing, and changes in prey availability due to ocean climate change.

Santa Cruz Island has a moderate breeding population but its status is poorly known. The chief reason for moderate population size is the greater availability of breeding habitats in cliffs and steep slopes primarily on the north side with low predation by native and non-native predators.

San Clemente Island has a relatively small breeding population (10-25 breeding pairs) and its status is poorly known (Carter *et al*. 2009, p. 21). Chief apparent reasons for small population size include limited breeding habitats with low predation by native and non-native predators and possible impacts to nesting habitats due to past Navy bombing.

Santa Catalina Island has a relatively small breeding population but its status is poorly known. The chief reason for small population size is limited breeding habitats with low predation by native and non-native predators.

Table 1: Population estimates of Xantus's murrelet nesting colonies in southern California and northwestern Baja California, Mexico.

Island	Breeding pairs	Year
Santa Barbara[1]	500-750	1991-2002
Anacapa[1]	200-600	1991-2002
Santa Cruz[1,2]	100-300	1991-2004
San Miguel[3]	10-50	2007
Santa Catalina[1,2]	25-75	1994-2000
San Clemente[4]	10-25	1994-1996
Coronado[2]	750-1,250	2004
Todos Santos[5]	100-200	2005
San Martín[6]	50-250	1999
San Gerónimo[6]	100-500	1999
San Benitos[7]	500-1,000	2002

Guadalupe[8]	2,400-3,500	1968

[1] Burkett *et al*. 2003, (pp. 13, Table 2 (H.R. Carter, pers. comm.)
[2] Whitworth *et al*. 2005a, pp. 2, 16 (2004 population assessments report)
[3] Carter *et al*. 2008, p. 5
[4] Carter *et al.* 2009, p.21
[5] Carter *et al*. 2006, p. 10
[6] Keitt 2000, p. 12; population estimates thought to be high (B. Keitt, Island Conservation and Ecology Group, pers. comm. 2003)
[7] Whitworth *et al*. 2003, p. 6 (San Benitos report)
[8] Delong and Crossin 1968, p. 5; this estimate is very high based on 2007 surveys (H.R. Carter, pers. comm. 2009).

DISTINCT POPULATION SEGMENT (DPS) (insert discussion as needed): N/A

THREATS

A. The present or threatened destruction, modification, or curtailment of its habitat or range.

Introduced Species

The introduction of non-native mammals (predators and non-predators) caused both reduced murrelet populations through predation and habitat modification and degradation at nearly all of the nesting colonies within the last two centuries in southern California, USA, and northwestern Baja California,Mexico (Everett and Anderson 1991, pp. 133-134; McChesney and Tershy 1998, pp. 335-347; McChesney *et al*. 2000, pp. 2, 3; Keitt 2005, pp. 108-112). Habitat modification as a result of livestock grazing, farming, and burning resulted in reductions of breeding habitats through removal of native vegetation, except for island perimeter areas. In recent decades, murrelets have bred primarily in rock crevices along island perimeters, with limited nesting under shrubs only at Santa Barbara and Guadalupe Islands. Great reduction of suitable nest sites under plants has resulted. Sheep (*Ovis aries*), rabbits (Leporidae), pigs (*Sus scrofa*), cattle (*Bos* sp.), and goats (*Capra hirca*) heavily grazed native vegetation, which resulted in a loss of vegetative diversity (McChesney and Tershy 1998, pp. 343-344). In addition to grazing on native vegetation, rabbits also competed for burrows and nest site crevices on some islands (McChesney and Tershy 1998, p. 336). In addition to the indirect effects caused by non-native species, large grazing animals may have crushed burrows, eggs, and chicks on some islands (McChesney and Tershy 1998, p. 344).

Non-native mammals have been eradicated from many of the nesting colonies in the last 50 years. In California, all non-native herbivores have been eradicated from Anacapa, Santa Barbara, San Miguel, and San Clemente Islands but remain on Santa Catalina Island (McChesney and Tershy 1998, p. 339). Rats currently remain on San Miguel, San Clemente, and Santa Catalina Islands; cats still occur on San Clemente and Santa Catalina Islands. Since 1994, the Island Conservation and Ecology Group and other groups have removed introduced mammals from every murrelet nesting colony in Mexico, with the exception of cats and dogs on Guadalupe Island (Keitt 2005, pp. 108, 112). Goats were removed from Guadalupe as recently

as 2007.

Although non-native herbivores have been largely absent from Santa Barbara Island since the late 1950s (Sumner 1958, pp. 3, 13, 15, 20), their presence, as well as the presence of farming, may have facilitated the spread of non-native grasses (Murray *et al*. 1983, p. 20). This conversion of native habitat to non-native grassland is thought to have increased the endemic deer mouse (*Peromyscus maniculatus elusus*) population, a predator of Xantus's murrelet eggs, and reduced available nesting habitat (Murray *et al*. 1983, p. 20) (see predation section below). The Montrose Settlements Restoration Program is currently improving nesting habitat for Xantus's murrelets through the removal of non-native vegetation and revegetation with native plants and shrubs (Montrose 2005, p. 6-10).

B. Overutilization for commercial, recreational, scientific, or educational purposes.

Overutilization for commercial, recreational, scientific, or educational purposes is not a known threat to this species.

C. Disease or predation.

Disease

Disease is not a known threat to this species. Parasites have been recovered from the digestive tract of adults including a cestode *Tetrabothrius* sp. and two nematodes, *Contracaecum* sp. and *Seuratia* sp. (Drost and Lewis 1995, p. 15). However, nothing is known regarding the effects of these parasites. No ectoparasites, nest parasites, or commensals have been reported for the species (Drost and Lewis 1995, p. 15).

Predation

Small seabirds, such as Xantus's murrelets, are susceptible to depredation due to their low annual reproductive output, small size, and lack of effective anti-predator behavior (Moors and Atkinson 1984, pp. 667-690). Seabird declines and extirpations at nesting colonies have been caused by non-native predators such as non-native rats (*Rattus* sp.) and feral cats (*Felis catus*) (Moors and Atkinson 1984, pp. 667-690) Everett and Anderson 1991 pp. 121-122, 124, 127, 133-134; Bertram 1995, pp. 865-872; Seto and Conant 1996, pp. 175-181; McChesney and Tershy 1998, pp. 336-334; Keitt 2005, pp. 105, 110-112). Dogs (*Canis familiarus*) may also prey on seabirds and destroy burrows and nest sites.

Rats prey primarily on Xantus's murrelet eggs and chicks, but are also capable of killing adults (Moors and Atkinson 1984, pp. 667-690; McChesney and Tershy 1998, p. 342). Rats have been reported to depredate unattended as well as incubated eggs (Seto and Conant 1996, p. 180). One report documented how rats efficiently killed Ancient murrelets by attacking and wounding the nape region (Bertram 1995, pp. 869-870). As of 2001, Norwegian rats were reported on all of the Channel Islands except Santa Barbara Island (Whitworth and Carter 2002, unpaginated).

Black rats were eradicated from Anacapa Island in 2002. In 2000-2002, prior to the rat eradication, only 42 percent of eggs hatched while 52 percent were rodent-depredated (Whitworth *et al*. 2005b, p. 133). In 2003-2005, after removal of rats on Anacapa Island, 80 percent of nests hatched successfully (Whitworth *et al*. 2005b, p. 133). Thus, the population on Anacapa Island is likely to increase over time as a result of increased productivity. Black rat eradication has been proposed at San Miguel Island as part of the Montrose Settlements Restoration Program (Montrose 2005, pp. 6-9, 6-10), which could result in an increase of the small murrelet population at that island. However, this eradication is no longer likely due to concerns about possible impacts to Island Foxes (J. Boyce, pers. comm. 2010).

Rats, cats, and dogs were introduced to many Xantus's murrelets nesting islands in Mexico, primarily by fishermen or military personnel (McChesney and Tershy 1998, p. 336). Reports of rats at some Mexican islands (i.e., Todos Santos and San Martín Islands) may have been the endemic woodrat (*Neotoma* sp.), which poses little threat to Xantus's murrelets because it is an herbivore (McChesney and Tershy 1998, p. 342). Since 1994, Island Conservation and Ecology Group and other groups have systematically removed rats, cats, and dogs from every murrelet nesting colony in Mexico, with the exception of cats and dogs on Guadalupe Island (Keitt 2005, pp. 108, 112). This is a significant recovery effort that may result in an increased murrelet population over time at these islands.

Cats were thought to be largely responsible for the low numbers and near extirpation of Xantus's murrelets on Santa Barbara Island in the late 1800s and early 1900s (Howell 1917, p. 22). However, historical evidence of impacts is poor and only low numbers of cats have been present since the 1920s; many murrelets likely escaped cat predation by breeding on inaccessible cliffs (H.R. Carter, pers. comm. 2010). The National Park Service removed cats from Santa Barbara Island by 1978 (Murray *et al*. 1983, p. 13). Cats were introduced on Anacapa Island in the 1930s, and the last cat died in 1975 or 1976 (Anderson *et al*. 1989, p. 100). Cats are also reported to occur on Santa Catalina, and San Clemente Islands (McChesney and Tershy 1998, p. 339).

Known native predators at nesting colonies include deer mice, barn owls, western gulls (*Larus occidentalis*), island spotted skunks (*Spilogale gracilis amphiala*) and peregrine falcons (*Falco peregrinus*) (Murray *et al*. 1983, p. 19; Drost and Lewis 1995, pp. 2-3; McChesney and Tershy 1998, pp. 335-336). The conversion of native habitat to non-native grassland on Santa Barbara Island is thought to have increased the endemic deer mouse population (Murray *et al*. 1983, p. 20). In a study conducted from 1976 to 1978, deer mice consumed 44 percent of Xantus's murrelet eggs (Murray *et al*. 1983, p. 13, 20). Predation by barn owls on Santa Barbara Island has been found to depend on the availability of other prey such as deer mice; when mice are rare, the number of Xantus's murrelets killed increases (Drost and Lewis 1995, pp. 9-10). Western gulls occasionally take Xantus's murrelet chicks, usually during the time that the chicks leave the nest and join their families at sea (Murray *et al*. 1983, p. 19). Peregrine falcons are known to pursue and kill small adult seabirds, and may become an increasing threat due to their recent reintroduction to the Channel Islands (Drost and Lewis 1995, pp. 9-10). They previously experienced a severe decline in the 1960s due to effects from DDT (Musitelli 2000, p. 2).

Skunks are known to eat bird eggs and chicks. Island fox (*Urocyon littoralis*) are a potential native predator, as they are known to eat bird eggs. In southern California, this predator has been thought to limit Xantus's murrelets to breeding in substantial numbers only on islands without island fox (e.g., Anacapa and Santa Barbara Islands) (Sowls *et al*. 1980, p. 47; Drost and Lewis 1995, pp. 2-3); however, recent surveys have shown substantial populations on Santa Cruz Island where birds apparently breed in inaccessible cliffs.

D. The inadequacy of existing regulatory mechanisms.

Xantus's murrelets are designated as threatened under the California Endangered Species Act (CESA) (California Regulatory Notice Register 2004, pp. 1-2). Section 2080 of the Fish and Game Code prohibits "take" of any species that the commission determines to be an endangered or threatened species. Take is defined in Section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." However, unlike federally listed species, "harassment" is not included in the Fish and Game Code's definition of take, giving it fewer protections than if it were federally listed.

Xantus's murrelets are protected under the Migratory Bird Treaty Act of 1918 (MBTA). The MBTA protects migratory birds and their parts (including eggs, nests, and feathers). However, the MBTA provides no protection for habitat. Protections of Xantus's murrelets by the MBTA have not been sufficient to arrest or reverse the decline off this species.

The U.S. Fish and Wildlife Service designated the Xantus's murrelet as a Category 2 in November 1994 (59 FR 58983). A category 2 referred to a "taxa for which information now in the possession of the [U.S. Fish and Wildlife Service] indicates that proposing to list as threatened or endangered is appropriate, but for which persuasive data on the biological vulnerability and threat are not currently available to support proposed rules." However, the candidate Category 2 status was discontinued in February 28, 1996 (61 FR 7596).

The Xantus's murrelet is included in the North American Commission for Environmental Cooperation. One of the Commission's initiatives is to conserve biodiversity across shared ecosystems by identifying priority species for conservation, recovery objectives, and potential collaborative actions. However, recovery objectives and conservation actions for the Xantus's murrelet have yet to be defined (CDFG 2002, p. 39).

E. Other natural or manmade factors affecting its continued existence.

Human Disturbance

In 2004, ChevronTexaco Corporation obtained a Mexican permit to build a liquefied natural gas (LNG) receiving and regasification terminal approximately 600 meters from shore off South Coronado Island just south of the U.S./Mexico border (Lindquist 2004, pp. 1-4). The terminal would have been a fixed 980-foot-long concrete island with two regasification plants, storage tanks, a heliport, and a dock that would receive LNG tankers every 4 days. Potential impacts of

this facility to the Xantus's murrelet nesting colony at the Coronados Islands included: (1) bright lights at night from the facility and visiting tanker vessels; (2) noise from the facility or from helicopters visiting the facility; (3) ingress and egress of tanker vessels or other vessels transporting personnel and supplies; (4) oil spills associated with visiting tanker vessels. However, ChevronTexaco announced in March 2007 that they have abandoned plans to develop this facility and withdrew their permits (Lindquist 2007, pp. 1-2).

There are three proposed LNG terminals in the waters in the vicinity of the Channel Islands. These are: (1) BHP Billiton's Cabrillo Deepwater Port 14 miles offshore of Oxnard and Malibu; (2) Crystal Energy's proposed conversion of the existing Platform Grace off Point Conception into an LNG terminal; and (3) Woodside Energy LNG terminal 18 miles from Santa Barbara Island in an area where there are currently no lighted platforms. None of these proposed LNG terminals is directly adjacent to Xantus's Murrelet nesting colonies in the Channel Islands; however, there are still potential impacts to murrelets from bright lights or from oil spills or pollution from visiting tanker vessels.

Each year, approximately 30,000 people visit the Channel Islands National Park and waters, and an additional 60,000 people enter park waters without accessing land (CINP 2002, p. 1). Visitors increase the risk of accidental introduction of non-native species to the islands. Kayaking in sea caves may disturb small numbers of nesting Xantus's murrelets, although it is unknown how much disturbance occurs. The National Park Service has been working to reduce this threat by educating kayak guides on caves to avoid due to the presence of nesting Xantus's murrelets and distances from cliff walls that should be maintained (Kate Faulkner, National Park Service, pers. comm. 2003). Some guides have been instructed by biologists and park rangers to avoid caves where seabirds are seen flying in with fish, which indicates the presence of a nest (Weiss 2002, pp. 1-3). In 2009, signs were placed at several caves at Santa Cruz Island to inform people that they are off limits, primarily to protect Ashy Storm-Petrels but some caves also have a few nesting murrelets McIver *et al.* 2010, p. 16).

Fishing villages

Fishing villages on nesting islands in Mexico are another source of potential disturbance from artificial lighting, as well as an ongoing risk of introducing (or re-introducing) predators such as rats and cats (Keitt 2005, pp. 112). San Benito, San Martin, San Gerònimo, Cedros, and Guadalupe Islands all have fishing villages or camps (Keitt 2005, pp. 109-111). At San Benito and San Jeronimo Islands, murrelets breed extensively inside fisherman huts where they are likely disturbed or eggs/adults crushed or eaten by fishermen; at San Martin and Cedros Islands, murrelets do not appear to breed near villages (Keitt 2005, p. 109; H.R. Carter, pers. comm. 2010).

Oil pollution

Oil spills and chronic oil pollution from oil tankers and other vessels, offshore oil platforms in the Southern California Bight (SCB), and numerous natural oil seeps in the Santa Barbara

Channel, continue to represent a potentially significant source of injury and mortality to Xantus's murrelets (Carter 2000, pp. 435, 438-441, 443). Small seabirds usually die from oiling, and if sufficient numbers are killed in particular areas, this mortality can cause significant reduction in numbers of breeding birds, reductions in breeding range, and reduced breeding success (Carter and Kuletz 1995, pp. 261-262, 267-268). Oil mortalities occur from hypothermia, starvation, drowning, or ingestion when they try to preen oil off their feathers (American Trader Trustee Council 2001, p. 10). There can be sublethal and lasting health impacts on oiled birds, such as decreased reproductive output, whether or not they receive rehabilitation (Carter and Kuletz 1995, p. 264). Dead or dying Xantus's murrelets are difficult to recover because they rarely come to ashore due to prevailing winds and currents, and because oiled carcasses often sink or are scavenged (American Trader Trustee Council 2001, p. 10; Carter *et al*. 2000, pp. 439-440). However, small numbers of dead oiled Xantus's murrelets have been reported on beaches in central and southern California (Carter *et al*. 2000, pp. 439-440).

Since 1984, several major oil spill-related seabird mortality events occurred along the coast of California, any of which may have adversely affected Xantus's murrelets (Carter 2003, pp. 1-3, Hampton *et al*. 2003, pp. 35-40). A large oil spill has the potential to lead to the extirpation of individual nesting colonies or local extinction of Xantus's murrelets, due to the species' extremely limited distribution and tendency to aggregate at nocturnal congregations adjacent to nesting colonies and potentially offshore at certain foraging areas during the breeding season (Carter *et al*. 2000, p. 440). Oil spills also adversely affect fish populations (Carter and Kuletz 1995, p. 264), which could affect prey resources for Xantus's murrelets and other seabirds.

There are 27 offshore oil platforms and 6 artificial oil and gas islands off the coast of southern and central California, and there is currently a moratorium on new oil platforms in State and Federal waters (McCrary *et al*. 2003, pp. 43, 45). There are no platforms within the Channel Islands National Marine Sanctuary, which extends 6 nautical miles (11.1 km) from the mean high water line and extends seaward offshore from five of eight Channel Islands (McCrary *et al*. 2003, pp. 43-48; NOAA, p. 140). Petroleum operations are prohibited within the sanctuary, with the exception of a three leases within sanctuary boundaries that existed prior to the sanctuary's creation in 1980, although new petroleum operations are unlikely to occur on these leases (McCrary *et al*. 2003, pp. 43-48; NOAA, p. 140). The sanctuary essentially provides a minor buffer for nesting colonies in the Channels Islands from the threat of oil platform accidents, allowing time for break-up of oil discharges, and time for oil spill clean-up crews to respond before the oil reaches shore. The last major spill from any of the oil platforms or associated pipelines was a well blowout in 1969 that released 80,000 barrels in the Santa Barbara Channel; which may have had significant impacts to Xantus's murrelets which were not documented (Carter *et.al.* 2000, p. 435); Minerals Management Service (MMS) estimates the risk of a spill of 1,000 barrels or more over the next 28 years at 41 percent for Federal operations (McCrary *et al*. 2003, pp. 45-46).

Marine sanctuary regulations prohibit vessels, including oil tankers, from operating within 1 nautical mile (1.85 km) of any of the Channel Islands. In the event of a major oil spill, this is probably an insufficient distance from the nesting colonies to prevent impacts. Vessels

frequently pass through the SCB in established shipping lanes that are within 3 miles (5 km) of Anacapa Island to the north and within 15 miles (25 km) of Santa Barbara Island (Carter *et al*. 2000, p. 436). A traffic separation scheme north of Anacapa Island in the Santa Barbara Channel separates opposing flows of vessel traffic. The shipping lanes and traffic separation scheme in the SCB reduces the likelihood of spills because it reduces the probability of vessel-to-vessel and vessel-to platform collisions. However, shipping traffic is increasing offshore of California and the potential for oil spills and pollution events is correspondingly higher (McCrary *et al*. 2003, p. 45). There is also a shipping lane that passes within 16 miles (25 km) of the Coronado Islands in Mexico, which represents a threat to the murrelet nesting colony there (Carter *et al*. 2000, p. 436).

MMS is responsible for inspection and monitoring of Outer Continental Shelf oil and gas operations (McCrary *et al*. 2003, pp. 45-47). Several U.S. and State laws were instituted in the 1970s to reduce oil pollution (Carter 2003, p. 2). In 1990, State and Federal oil pollution acts were passed, and agencies developed programs to gather data on seabird mortality from oil spills, improve seabird rehabilitation programs, and develop restoration projects for seabirds (Carter 2003, p. 2). There have also been improvements in oil spill response time, containment, and cleanup equipment (McCrary *et al*. 2003, p. 47). These measures have not eliminated the threat of oil spills, but have reduced the likelihood of spills, and may alleviate impacts on murrelets and other seabirds if a spill were to occur (Carter 2003, p. 3).

Artificial light pollution

Many nocturnal seabirds are attracted to bright lights on commercial fishing vessels (Howell 1910, p. 186; Cherel *et al*. 1996, pp. 67-68). Xantus's murrelets and other seabirds can become exhausted by their continual attraction and fluttering near lights or collide with lighted vessels, the impact resulting in injury or death (Herbert 1970, pp. 400-419; Bower 2000, pp. 1-4). There have been several occurrences where lighted vessels along coastlines have reported numerous seabirds colliding with vessels (Dick and Donaldson 1978, pp. 235-236). Several seabird species have been captured as a result of light attraction and disorientation (Carter *et al*. 2000, p. 443; Whitworth *et al*. 1997, pp. 525, 527). Chicks have been known to become separated from their parents due to vessel lights, which would result in death of the chicks because they are dependent on their parents for food (Gaston and Jones 1998, pp. 208, 210). Gull activity and predation on seabirds is greater on moonlit nights and under lighted conditions than on dark nights (Nelson 1989, pp. 495-497; Keitt 2004, p. 177).

On moonlit nights, many nocturnal seabirds display reduced activity levels such as fewer nest site visits and fewer chick departures to sea, which is thought to occur in order to avoid predation (Manuwal 1974, pp. 422-424; Watanuki 1986, pp. 15-18; Nelson 1989, pp. 495-497; Ainley *et al*. 1990, pp. 140-143, 312-315; Jones *et al*. 1990, pp. 438, 440; Keitt 2004, pp.173-177). The CDFG (2002, p. 33) report states that "it is reasonable to expect that successive nights of high artificial light levels on and around breeding colonies would disrupt the normal nesting activities of Xantus's murrelets, which could result in nest abandonment, increased mortality of eggs and/or chicks, and increased predation rates of adults that do not return during lighted

conditions."

One major concern involves high-wattage lights (more than 30,000 watts per boat) used on commercial market squid (*Loligo opalescens*) fishing vessels at night to attract squid to the surface of the water. In certain years, these boats have been reported operating in shallow waters near Xantus's murrelet nesting colonies in the California Channel Islands, with several vessels often fishing simultaneously in the same area (American Trader Trustee Council 2001 Appendix A, p. 2). Unusually high predation on Xantus's murrelets by western gulls and barn owls was reported at Santa Barbara Island in 1999, and was attributed partly to bright lights from the squid fishing that occurred directly offshore for much of the breeding season (Wolf *et al*. 2000, pp. 7-10, 13).

To reduce impacts to nesting seabirds in the Channel Islands, the California Fish and Game Commission required light shields and a limit of 30,000 watts per boat, adopted in 2004 (CDFG Regulations, Section 149, Title 14, CCR), although squid fishing in specific areas was not restricted. It is unknown if the required light shields are sufficient to reduce impacts. Squid fishing has been observed sporadically around the Channel Islands in recent years (Whitworth *et al*. 2005a, p. 19). However, it has not occurred near the colonies at a noticeable level since 1999, probably because abundance and location of squid is highly variable, and squid may have not been available near the nesting colonies. Squid fishing is highly profitable, so this threat could recur at some point in the future. It is unknown if commercial squid fishing is a threat to murrelets in Mexico; however, the range of market squid includes coastal Baja California.

Lights at any of the proposed LNG facilities in the Channel Islands have the potential to impact the Xantus's murrelets at sea, although the degree of these impacts are largely unknown at this point. However, unlike the squid fisheries, which are sporadic and mobile, these would be permanent facilities and any impacts would be ongoing and long-term.

Lighted structures on islands and lighted vessels anchored beside islands also are problems that need to be addressed. At South Coronado Island, support vessels for a tuna farm have bright

lights every night during the breeding season; and at Santa Cruz Island, diving charter boats conduct night dives with brightly-lit vessels (H.R. Carter, pers. comm. 2010).

Prey decline

Xantus's murrelets feed on small schooling fishes such as Northern anchovies (*Engraulis mordax*), rockfish (*Sebastes* sp.), sand lance/sandeels (*Ammodytes* sp.), and larval Pacific sauries (*Cololabis saira*), and euphausiids (*Thysanoessa spinifera*) (Hunt *et al*. 1979, p. III-184, Hamilton *et al*. 2004, p. 154). Because reproductive success of seabirds is affected by availability and abundance of prey (Sydeman *et al*. 2001, p. 325), declines in the Xantus's murrelet population could be a result of declines in prey resources. Zooplankton (i.e., euphausiids) in the Southern California Bight declined by 80 percent between the 1950s and early 1990s (Roemmich and McGowan 1995, pp. 1324-1326). Xantus's murrelets on Santa

Barbara Island responded to the unavailability of larval northern anchovies by either failing to breed or delaying breeding until anchovies were more available (Hunt and Butler 1980, p. 65-66). Changes in oceanographic conditions, such as large shifts in sea surface temperatures, may affect Xantus's murrelet food supply (Roth and Sydeman 2000, p. 83). Roth et al. (2005, pp. 116-119) found that murrelets bred earlier and had higher clutch sizes in years with more abundant prey; however, it is possible that clutch size does not vary between years and that predation by deer mice is the main reason for greater detection of only one egg of two-egg clutches in certain years (H.R. Carter, pers. comm. 2010). More information on the subject of prey decline is needed.

Military activities

Weapons testing and training exercises occur routinely in the Sea Test Range off southern California, and operations on Naval Base San Clemente Island overlap with potential foraging habitat of Xantus's murrelets (Carter *et al*. 2000, pp. 441-442). These activities may disturb Xantus's murrelets at sea using these areas. The Department of the Navy's Integrated Natural Resources Management Plan for San Clemente Island takes into consideration possible effects to the Xantus's murrelet at sea (USDoN, SWDIV 2002, pp. D-53 and D-54). A Mexican Navy outpost is located on South Coronado Island, and an active military garrison exists on Guadalupe Island (Keitt 2005, pp. 107, 110). As with all human activity, the presence of military personnel and activities increase the threat of introducing non-native predators to Xantus's murrelet colonies (McChesney and Tershy 1998, p. 336), and lights associated with these facilities could be having ongoing impacts to the species. However, these facilities do not occur immediately adjacent to nesting areas and may have no impacts (H.R. Carter, pers. comm. 2010). We have no direct information on the impacts of these activities; more information is needed.

Fisheries bycatch

Threats to Xantus's murrelets include mortality via bycatch in fisheries (Drost and Lewis 1995, p. 18; Carter *et al*. 2000, pp. 437, 442-443). Xantus's murrelets have been reported as bycatch in various set and drift gill-nets in British Columbia (Carter et al. 2000, pp. 437, 442-443; CDFG 2002, p. 37, PSG 2002, p. 20). No Xantus's murrelets have been documented as bycatch in California, although no observer program exists for these fisheries (CDFG 2002, p. 37). Bycatch may have minor effects on Xantus's murrelet populations but combined with other factors, may add to their decline as a whole (CDFG 2002, p. 37; PSG 2002, pp. 20-23). More information on this subject is needed.

CONSERVATION MEASURES PLANNED OR IMPLEMENTED (U.S. ISLANDS ONLY)

The American Trader Trustee Council funded rat eradication at Anacapa Island in 2001-02. Monitoring continues to measure benefits to Xantus's Murrelets through increased hatching success and expanded nesting distribution (Whitworth et al. 2005b, pp. 133-135).

The Montrose Settlements Restoration Program (MSRP) is implementing plant restoration to

improve certain murrelet breeding habitats on Santa Barbara Island (Laurie Harvey, National Park Service, pers. comm. 2009). In addition, MSRP would like to eradicate rats from San Miguel Island but this seems impractical at this time due to possible impacts on Island Fox (Jennifer Boyce, Montrose Settlements Restoration Program, pers. comm. 2008). The Santa Barbara Island project aims to help create natural breeding conditions for murrelets in areas little used by murrelets in recent decades which should have beneficial effects through increased nest success, nest occupancy, and eventual increases in the population size.

Marine protected areas have been implemented which reduce light pollution in relatively small areas at Santa Barbara, Anacapa, Santa Cruz, and San Miguel.

SUMMARY OF THREATS (including reasons for addition or removal from candidacy, if appropriate)

Identified threats to Xantus's murrelets include oil spills and oil pollution, lights and disturbance from the proposed LNG facilities in the Channel Islands, light pollution from squid fisheries and other vessels, human disturbance at nesting colonies, predation from native and non-native predators at nesting colonies, and reduced prey availability. We find that the Xantus's murrelet is warranted for listing throughout all its range, and, therefore, find that it is unnecessary to analyze whether it is threatened or endangered in a significant portion of its range.

For species that are being removed from candidate status:

____Is the removal based in whole or in part on one or more individual conservation efforts that you determined met the standards in the Policy for Evaluation of Conservation Efforts When Making Listing Decisions (PECE)?

RECOMMENDED CONSERVATION MEASURES (U.S. ISLANDS ONLY)

Eradicate or control non-native mammals (especially rats and cats) at San Miguel, San Clemente, and Santa Catalina Islands. Prevent introductions or re-introductions of non-native predators.

Reduce heightened levels of predation by native predators (mammalian and avian) in human-altered nesting habitats at Santa Barbara Island.

Reduce sources of artificial lighting and other human disturbances at or near nesting colonies. Implement marine protected areas at San Clemente and Santa Catalina Islands that protect limited nesting habitats; improve existing marine protected areas at other U.S. islands with breeding populations.

Restore nesting habitats damaged by Navy bombing at San Miguel (Prince Island) and San Clemente.

Conduct genetics analyses to assess species and subspecies relationships, genetic structure, and intercolony movements. Preliminary genetics work (Birt *et al*. 2008, p. 6) suggests Guadalupe Island murrelets (*S. h. hypoleucus*) are a different species than murrelets at other colonies (*S. h. scrippsi*). This significantly reduces world population size and breeding distribution plus increases the importance of the U.S. portion of the world population of *S. h. scrippsi*.

Develop oil spill contingency plans for assessing impacts to murrelet populations and for capture of live oiled birds for rehabilitation, without extensive disturbance of breeding birds and breeding habitats. Examine the potential of booming areas within 1 mile of colonies to prevent oil from reaching nearshore areas where murrelets congregate at night.

LISTING PRIORITY

THREAT			
Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	5*
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

Rationale for listing priority number:

Magnitude: High. Xantus's murrelets have an extremely limited breeding range, as the entire world population nests on only 12 islands within about 500 miles of coastline in southern California and along the coast of Baja California (PSG 2002, p. 1). Therefore, identified threats such as a large oil spill or reduced prey availability could put significant portions of the population at risk of extinction. Artificial lighting from the three proposed LNG facilities in the Channel Islands, if any of them are built, could have long-term impacts on the northern portion of the population. Further, the cumulative effects of other known and ongoing threats, such as chronic low productivity resulting in long-term declines in the population at Santa Barbara Island, human disturbance at nesting islands, predation by non-native mammals, enhanced levels of predation by native mammals and birds, and artificial light pollution, may make the species

more susceptible to extinction at some point in the future.

Imminence: Non-Imminent. The identified threats, such as the threat of oil spills, the proposed LNG facilities, light pollution, and predation, are not imminently threatening the population with extinction. The three proposed LNG facilities in the Channel Islands are non-imminent threats because these are early in the complex and long-term planning processes, and it is possible that none of these facilities will be built. In addition, none of them are directly adjacent to nesting colonies, where their impacts would be expected to be more significant. Artificial light pollution from squid fisheries is not considered an imminent threat because it has not occurred at a particularly noticeable level near any of the colonies in the Channel Islands since 1999, although this could be a problem at some point in the future. Predation by non-native mammals is not an imminent threat because these predators have been systematically eradicated from the nesting colonies in the U.S. and Mexico, and there are few colonies that currently contain non-native predators.

Rationale for Change in Listing Priority Number (insert if appropriate):

___ Have you promptly reviewed all of the information received regarding the species for the purpose of determining whether emergency listing is needed?

Is Emergency Listing Warranted? No.

DESCRIPTION OF MONITORING (U.S. ISLANDS ONLY)

Many nesting colonies in the U.S. have recently been monitored and assessed (since 1990) by Federal and state agencies, private organizations and universities, including Channel Islands National Park, Humboldt State University, California Institute of Environmental Studies, Carter Biological Consulting, and Hamer Environmental, L.L.P. Most funding has been provided by the National Park Service, American Trader Trustee Council, Montrose Trustee Council, U.S. Navy, and California Department of Fish and Game. By 2011, funding will be provided primarily by the Montrose Trustee Council and will be focused mainly at Santa Barbara Island until about 2018. A long-term monitoring program and associated funding plan is needed for all U.S. islands with breeding populations. Funding has been provided by the California Department of Fish and Game in 2009 for a Xantus's murrelet breeding colony management and restoration plan for U.S. and Mexico islands; this plan is being prepared by Humboldt State University, with assistance from many researchers and federal and state agency input.

We are periodically receiving unpublished reports on the results of these monitoring activities. A Xantus's Murrelet symposium was published by Marine Ornithology in 2005, and this collection of peer-reviewed articles has increased our ability to assess the status of the species.

COORDINATION WITH STATES

Indicate which State(s) (within the range of the species) provided information or comments on the species or latest species assessment: None

Indicate which State(s) did not provide any information or comments: See above

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APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes, including elevations or removals from candidate status and listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all resubmitted 12-month petition findings, additions or removal of species from candidate status, and listing priority changes.

Approve: _____ 6.7.2010
Regional Director, Fish and Wildlife Service Date

Concur: _____ Date: October 22, 2010
ACTING
Director, Fish and Wildlife Service

Do not concur: _____
Director, Fish and Wildlife Service Date

Director's Remarks:

Date of annual review: April 23, 2010
Conducted by: Robert McMorran

FY 2010, R8 CNOR: Xantus's murrelet